a brief notice of the ancient kings of Nineveh and Babylon," London, 1850; and "Outline of the History of Assyria," London, 1852; and "Notes on the Early History of Babylonia," 1854. He had also in 1850 and 1851 revised the "Inscriptions in the Cuneiform Character from Assyrian Monuments," which Mr. Layard published in 1851. Curiously enough, though Rawlinson's translation of the Behistun inscription was accepted generally, there were many, and Sir G. C. Lewis was among them, who stated unhesitatingly that the cuneiform inscriptions had not yet been accurately deciphered, and we owe it to Mr. Fox Talbot that this view was proved to be erroneous. Rawlinson had undertaken to publish a series of cuneiform texts with English translations of the same for the Trustees of the British Museum, and Talbot, having obtained a set of the plates of the text of the great Tiglath Pileser inscription, began to work at an independent translation which, when finished, he sent in a sealed packet to the Council of the Royal Asiatic Society, pointing out that if his own translation and that of Rawlinson, when it appeared, should agree, a strong proof of the accuracy of Rawlinson's system would be established. The Council appointed a Committee consisting of Dean Milman, Whewell, Gardner Wilkinson, Grote, Cureton, and Prof. Wilson as examiners, and they asked Rawlinson, Oppert and Hincks to send in versions of the same inscription by a certain date. Talbot's arrived first, Rawlinson's next, Hincks's next, and Oppert's next; the last two scholars could not, however, translate all the inscription for want of time. The four independent translations[1] were carefully examined, and it was found that they agreed as to general sense in a marvellous manner, and the Committee rightly judged that the decipherment of the cuneiform inscriptions was a *fait accompli;* Rawlinson, however, translated the whole text, while his three competitors left passages here and there unrendered.

In the matter of publication, Rawlinson's greatest work was undoubtedly the "Cuneiform Inscriptions of Western Asia" in five vols. folio, which he prepared for the Trustees of the British Museum; here he supplied material for generations of workers, and gave the proofs of his knowledge and ability in cuneiform matters, which have justly earned for him the title of "Father of Assyriology." Between the years 1858 and 1875 he largely assisted his brother Prof. Rawlinson in his works on Oriental history, and a large share of whatever credit attaches to them is due to him. His last published translation was that of the cylinder of Cyrus, which recorded his conquest of Babylon; it appeared in the *Journal of the Royal Asiatic Society*, new series, vol. xii. (1880) p. 70. As was to be expected, honours were showered upon Rawlinson from all parts of the civilised world. He was elected to a Trusteeship of the British Museum—a much coveted honour—in 1876; Oxford, Cambridge, and Edinburgh gave him honorary degrees; Prussia awarded him the "Ordre pour le Mérite"; and the Academies of other countries elected him to Memberships. In summing up his labours, it is hard to say whether he did most for cuneiform scholarship, or to advance the interests and empire of Her Britannic Majesty in the East. Small-minded men, wishing to lessen Rawlinson's merits, have harped upon the fact that Lassen made his alphabet before Rawlinson; but this he freely admitted, only saying in reply that he never saw it until 1839. That Rawlinson was the first European who translated cuneiform inscriptions, is beyond all doubt, and from first to last, *i.e.* from 1835 to 1895, he exercised a wise and beneficent influence over cuneiform studies which cannot be overrated. His position in Persia gave him unrivalled opportunities, which he used to the best of his ability, and as Consul of Bagdad from 1844 to 1855, his strong but silent power was freely exerted on behalf of Mr. Layard while carrying on his work at Kouyunjik; beyond all doubt is it the fact that he has done more for cuneiform research and excavation than any other man living or dead. It must never be forgotten, too, that he was the only early excavator who had fully qualified himself to understand his work, and of them all he was the only one who could read cuneiform. He was a fine example of the English soldier, now only too rare, for to the bravery of the warrior he added the courtesy of the diplomat, and a wide knowledge of Oriental countries, languages, and history; his modesty was as great as his learning was deep. His ready wit and honest straightforwardness made him a favourite at every Oriental Court, and helped greatly to bring his plans to a successful issue; and his fearless bearing and manly love of warlike exercises attracted to him the admiration of the Indian and Persian soldiers who came in contact with him. His tolerance led men, both in the East and in the West, to confide in him, while his natural good-heartedness often made them like him as much as they trusted him. Other Englishmen have left behind them in the East fame for a certain exploit, or renown as great horsemen, &c., but no man was more feared and liked throughout the East than Henry Creswicke Rawlinson. He was a thorough Englishman, and with him English interests were paramount everywhere; he never forgot, too, in spite of his gracious bearing to all, that he was a trusted servant of the "Right Honourable John Company Sahib Bahadur." Wherever he went he impressed his personality in a marvellous degree, and an idea of the reputation which he left behind him in Bagdad may be gained from the remark which an old native of that city made to a British merchant some years ago. "Sahib, in the days of Rawlinson Sahib, may God lengthen his life, if you had put an English hat on the head of a dog and sent him through the bazaar, the Turks would have made way for him and bowed to him on the right and left as he passed, and now they spit on us as they pass us."

NOTES.

We are glad to learn that Prof. Huxley is now rapidly recovering from his recent attack of influenza.

Reference was made last week to the activity and great development of the Brooklyn Institute of Arts and Sciences. Among the most successful of its recent enterprises must be counted the establishment of a summer school of biology by the sea. The first session was held in July and August 1890, at Cold Spring Harbour, on the north shore of Long Island, in a building lent by the New York Fish Commissioners. The school annually increased in size and importance, and a specially designed laboratory, capable of accommodating fifty students, was last year opened for work in the same locality. The laboratory is well arranged for the purposes of lectures and practical instruction, and possesses private laboratories for investigators, a library, aquaria with running water, both salt and fresh, boats, microscopes—indeed everything needed to make profitable a summer at the sea-shore. It is impossible to over-estimate the advantages which marine laboratories afford for the purpose of biological instruction; and America may be congratulated upon the successful inauguration of an institution specially adapted to subserve this important end.

We drew attention a short time ago (Nature, vol. xlix. p. 597) to the fact that the late Sir W. Macleay had willed to his executors the sum of £12,000, for the foundation of a chair of Bacteriology in the Sydney University. The terms of the bequest provided for a six months' course on the subject, to be binding on every student before being admitted to a science or medical degree at the University. Pending the inability of the Senate to accept, within a month after notice of the legacy, the conditions contained in a memorandum annexed to the will, the legacy was to be void, and the sum given over to the Linnean Society of New South Wales, for the endowment of research in bacteriology. On receiving the money, the senators, the majority of whom are lawyers, have sought a judicial interpretation of the words "six months' course," and have secured the handsome endowment to themselves, on the ruling of Court, for disposal on their own terms. What they will do with it remains to be seen. Sir W. Macleay had been a member of the Senate, and his impression of its conduct may be gauged from the fact that in bequeathing this very legacy he took especial pains to protect his executors against that which he termed "its very uncertain views." In this he has failed! "Sharp practice" may be a conventional, but it is hardly a befitting term for the behaviour of the Senate, which thus expresses the gratitude of a colony for the devotion of a life and fortune to the advancement of science and scientific education.

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[1] See Rawlinson, "Inscription of Tiglath-Pileser I., King of Assyria, about 1150 B.C." (London, 1857.)

We understand that the Macleay memorial volume is selling very slowly. Its promoters are considerably to the bad on the undertaking,

Dr. Doberck would be glad if astronomers who notice shooting stars having radiants south of the equator, will send their observations for discussion to the Hong Kong Observatory, where some attention is being paid to southern shooting stars.

General Sir George Chesney, to whom belongs the credit of originating and organising the Royal Indian Engineering College at Coopers Hill, died on Sunday.

Prof. Ludwig Schläfli, the well-known Swiss mathematician, has just died at Berne, at the age of eighty. In 1853 he was appointed professor of mathematics at the University of Berne, where he first acted as *privat-docent*, but some time ago he gave up his post on account of his advanced years.

Messrs. Sotheby, Wilkinson, and Hodge will include the original autograph manuscript of Gilbert White's "Natural History and Antiquities of Selborne" in their sale commencing April 22. Several passages in the manuscript have not been published, and the whole has never passed out of the possession of the lineal descendants of the author.

The Geologists' Association have arranged an excursion to the Tertiary Beds of the Isle of Wight, during Easter, under the direction of Mr. R. S. Herries and Mr. H. W. Monckton. The party will leave London next Thursday, and will return on the following Tuesday.

The Liverpool Marine Biology Committee have appointed Mr. J. C. Sumner, from the Biological Laboratory of the Royal College of Science, South Kensington, as Curator of the Port Erin Biological station.

Dr. Jentink, of Leyden, has recently drawn attention to the scantiness of trustworthy evidence concerning the distribution of the two species of Rhinoceros which inhabit the Malay archipelago. It is sometimes stated that both species (*R. sumatrensis* and *R. sondaicus*) are to be found in Borneo, Sumatra, and Java; but it appears that nothing can be maintained with absolute certainty at present, except that *R. sondaicus* inhabits Java, and *R. sunatrensis* both Sumatra and Borneo. It is clearly desirable that any authentic information bearing upon this point should be brought to light, if yet unpublished.

The Biological and Microscopical Section of the Academy of Natural Sciences of Philadelphia have just sustained a severe loss by the sudden death of Dr. George A. Rex. Dr. Rex was the highest authority an the Myxomycetes in the United States. He was the author of numerous species, which, owing to his extreme conservatism, will doubtless continue to bear his name. Many forms, new to him, remained in his collection unnamed for years, and were only published when he had thoroughly convinced himself that they were really new to science. Although he was interested principally in the Myxomycetes, he was an earnest student of the lower orders of fungi, and an ardent admirer of everything beautiful in microscopic nature.

We have also to record the deaths of a number of other scientific workers in the United States. Dr. Darwin G. Eaton died in the evening of March 17, aged seventy-two. He was prominent as an instructor in the Packer Institute and in the Long Island College Hospital. His works belong chiefly to chemistry and astronomy. He was twice a member of Government parties to observe eclipses of the sun. Dr. P. H. Van der Weyde died a few hours later, on the 18th ult. He was born at Wymeguen, Holland, in 1813, and removed to New York in 1849. He taught in the University of the City of New York, at Cooper Union, and Girard College. Dr. Henry Coppee, acting president of Lehigh University, died March 20, at Bethlehem, Pa., aged seventy-five years. He was elected Regent of the Smithsonian Institution in 1874. Mr. Isaac Sprague, well known as a botanist and artist, and illustrator of botanical works, died at Wellesley Mills, Mass., March 13.

We notice the announcement of the death of Mr. A. G. More, who for many years exercised an influence of a special kind on the zoologists and botanists of Ireland as an authority to whom they implicitly referred questions on the subject of the determination of the species of Irish birds and Irish plants. Under the modest title of "Contributions towards a Cybele Hibernica," in conjunction with the late Dr. David Moore, he published in 1866 an excellent account of the geographical distribution of plants in Ireland. Another good piece of work by him was his list of Irish birds, published in the year 1885, in connection with the collection in the Dublin Science and Art Museum, and in 1887 he published an excellent guide to the Natural History Department of the Museum. He succeeded Dr. Carte as Curator of that department, but illness compelled him to retire in 1887, after twenty years' service.

The annual banquet of the Institution of Civil Engineers took place on Wednesday, March 27, a distinguished company being present. Sir Robert Rawlinson, K.C.B. (the President) occupied the chair, and among the guests were the Duke of Cambridge, the Duke of Teck, the American Ambassador, the Marquis of Salisbury, Sir John Fowler, Sir Frederick Bramwell, Sir Redvers Buller, Mr. C. T. Ritchie, Sir F. A. Abel, Sir George Stokes, Sir Courtenay Boyle, Sir John Donnelly, Mr. Henry Kimber, M.P. (Master of the Merchant Taylors' Company), Dr. Anderson, Sir B. Baker, Mr. C. Barry, Prof. Forbes, Dr. Frankland, Mr. Hawksley, Dr. Kennedy, Sir G. L. Molesworth, Mr. Preece, Mr. Rennie, Prof. Roberts-Austen, Sir David Salomons, Prof. Unwin, Mr. Walmisley, and Mr. Yarrow. The Marquis of Salisbury, in proposing the toast of "The Institution of Civil Engineers," dwelt upon the system of sanitary military reform set on foot by Sir Robert Rawlinson, and which has had such benefical results. He continued:—The system has yet some advance to make, and I hope some day the civil engineers, if the military engineers do not do it, will remove the reproach of typhoid fever from our barracks. But an enormous distance has been traversed by the genius of civil engineers, and by none more than by the President who occupies your chair; and I think it has reacted on civil society. We never really took in hand the sanitation of our civil population until we had been taught by necessity, by the evils attacking our military forces, and the remedies that were adopted, to confront those evils; and the result of the last forty years of sanitary exertion on the part of civil engineers, is one of the most splendid triumphs in the history of any profession which has adorned this country. You have done what many a continental nation wishes it could imitate you in doing. You have driven cholera from your shores. It can no longer make any impression upon us, and year by year the health of the population grows, the sanitary reforms increase, and you have converted all those who once doubted to believe in the sanitary character of the maxims which you inculcate and the methods which you propose.

MAJOR CARDEW'S report on the circumstances attending the accidents which have lately occurred in London, in connection with electric light mains, has been published in a Parliamentary paper. The accidents were of two kinds—those due to severe electric shocks caused by strong electrification of the surface of the ground, and those resulting from explosions in the street boxes through which the electric light mains run. In the City cases investigated by Major Cardew, the immediate causes of the accidents were: the breaking down of the insulation of a high pressure main in a street box, causing the formation of a powerful electric arc between the outer conductor of this main and the end of an iron pipe, forming a conduit for the mains, which projected into this box, and the consequent charging of this pipe to a dangerous extent; and the presence of gas in the Electric Light Company's pipes and street boxes to an amount which formed a highly explosive mixture afterwards fired by the electric arc. In the case of explosions in the St. Pancras district, it was suggested that the explosive gas was derived from the sewers, and also that it was hydrogen generated by electrolytic action. Major Cardew could find, however, no trace of such action, and, after careful consideration of the evidence and his own investigations, he concludes that the explosions were caused by the firing of a mixture of coal-gas and air by an electric spark. No time should, therefore, be lost in removing these two existing causes of danger, namely, the possibility of an accumulation of coal-gas in the conduits and that of the occurrence of an electric spark at the mains, whether the mains be insulated or of bare copper strip, such as is used by the St. Pancras Vestry. This Vestry has previously had their attention drawn to the necessity of efficient ventilation, but have failed to remedy the defects. The inquiry elicited the fact that there are only eleven ventilating pipes and three ventilating covers to street boxes for a total length of six and a half miles of conduit, a proportion quite inadequate for the immediate escape of gas from the conduits. Major Cardew recommends that accumulation of gas should be prevented by thorough ventilation, by making the sides and bottoms of street boxes impervious to gas, and by filling up the boxes as far as practicable with incombustible material. It is to be hoped that the Board of Trade will see that his recommendations on this and other sources of danger are acted upon.

THE New York Academy of Sciences, on Wednesday, March 13, repeated the experiment, begun last year, of giving an annual exhibition, with very gratifying results. Numerous scientific instruments were exhibited; the apparatus which excited most general interest being one for testing and photographing the voice.

A MEETING of the Institution of Mechanical Engineers will be held on Wednesday evening, April 24, and Friday evening, April 26, at 25 Great George Street, Westminster. The discussion will be resumed, on the Wednesday evening, upon the governing of steam engines by throttling and by variable expansion, by Captain H. Riall Sankey. The third report to the Alloys Research Committee will be presented by Prof. W. C. Roberts-Austen, C.B., F.R.S., and also appendices to it on the elimination of impurities during the process of making "best selected" copper, by Mr. Allan Gibb, and on the pyrometric examination of the alloys of copper and tin, by Mr. Alfred Stansfield. The anniversary dinner will take place on Thursday evening, April 25.

THE New York signal service office, a branch of the United States weather bureau, has just been removed from the Equitable building, No. 120 Broadway, which has been its headquarters for twenty-four years, to the new Manhattan Life Insurance Company's building, No. 66 Broadway, which is now one of the highest buildings in the world. The bureau will occupy the twenty-first, twenty-second, and twenty-third stories in the tower, and the observations will be made at a height of 356 feet above the street, or 380 feet above tide water. The old quarters were only 185 feet from the street. The equipment will all be new, and will include electric signal lights, which can be seen as far as Asbury Park and Fire Island. When the weather bureau was established in 1870, it occupied the top floor of a building in Wall Street for a few months. On the completion of the Equitable building, that was selected as then the highest in the city, but the rapid growth of tall office buildings all around has made it undesirable as an observing station. Even the present lofty quarters will soon be overtopped by the building of the American Surety Company, twenty-seven stories high, on the corner of Broadway and Pine Streets, between the Equitable and the Manhattan buildings.

EXTENSIVE geological researches have been made by Russian mining officers, as well as by professors of the Tomsk university, in connection with the Siberian railway, which, as is known, has already been completed as far as the Irtysh, opposite Omsk. Numerous layers of coal have been found in the basin of the Irtysh, but none of them have any industrial value. Rich palæontological collections, which very well characterise the age of the coal-bearing deposits of the Kirghiz Steppe, have, however, been made out at Bez-tyube. The best coal was found at Kuu-cheku, 40 miles from Karaganda, but it is too far from the railway (375 miles) to have an immediate practical value. The great difficulty which the builders of the railway have to contend with is the total absence of building stone in these lowlands, covered with clays and sands. Thus, for the building of the bridge over the Irtysh, near Omsk, new carlies had to be opened higher up the river, but the cost of extraction and transport was so great that most of the stone required for the bridge is brought by rail from Chelyabinsk, a distance of nearly 500 miles.

THE Society of Naturalists at the St. Petersburg University which celebrated last year its twenty-fifth anniversary, has issued an excellent volume containing a review of its five-and-twenty years' activity. Each branch (zoology, physiology, botany, and geology) is treated by a specialist, and the reviews show at a glance what has been done in each of these divisions of science; while the work of botanical, zoological, &c., exploration of the Russian Empire which has been accomplished by members of the Society, is represented on two maps. It is sufficient to say that the White Sea, the Caspian Sea, the Aral-Caspian and the Altai expeditions, which have so often been mentioned in these columns, the Crimea and the Neva Permanent Committees, and the Solovetsky biological stations, are the work of the Society. The volume is adorned by a good portrait of the late Prof. K. Th. Kessler, the founder of the Congresses of the Russian Naturalists and Doctors, and also of the Societies of Naturalists at all the

Russian Universities. The Society, which began twenty-five years ago with 74 members only, has now 374 active and 25 honorary members.

THE Kazan Society of Naturalists at the Kazan University, which was founded in 1869, has also issued a similar anniversary volume, in which the review of work done in botany is especially valuable, as it has been written on the above plan. The volume contains also an index of all papers published in the twenty-seven volumes of its *Bulletin* and *Memoirs*, the titles of the papers being given both in Russian and German.

AN old estimate of the frequency of earthquakes was that no a day passed without a shock being felt somewhere on the earth. In a new determination (*Comptes rendus*, vol. cxx. pp. 577–579), M. de Montessus de Ballore obtains a much higher figure. Dividing all the registers we possess into historical, seismologica and seismographical, and assuming the latter to be perfect, he finds, by comparing the different classes for the same region, that in the first 96·24 per cent., and in the second 84·48 per cent., of the total number of shocks escape record. In a group of well-studied earthquake districts, with a combined area of 11,691,000 sq. km., the average yearly numbers of shocks for the three classes are 341·35, 878·57, and 2222·24 respectively. Hence, multiplying by the proper factors for the first two classes, it would appear that the total number of shocks actually occurring in the above area must be estimated at 16,957 a year, or one in every half-hour.

IN several papers of great interest (*Atti della R. Acc. dei Fisiocritici*, Siena, vol. v., 1894), Prof. G. Vicentini describes his new seismometrograph erected at Siena, and the seismic record obtained with it from February to July, 1894. The instrument consists of a heavy pendulum, 1½ m. in length and 50 kg. in mass, the base of which is connected with one end of a very light vertical magnifying lever. The other end of this lever is connected with the ends of two light horizontal levers placed at right angles to one another. These magnify the original movement of the ground seventy times, and trace fine lines on two strips of smoked paper moving at the rate of 2 mm. a minute. With this arrangement the heavy mass, it is found, remains stationary during vibrations of the ground, and the trace ceases simultaneously with the removal of the disturbing cause. For seismic purposes, the instrument possesses several advantages, especially the small cost of working and the rapid movement of the paper bands. In the plates accompanying the papers, copies are given of the traces produced by passing carriages, by strong gusts of wind, and by several earthquakes, the most beautiful being those of the Japanese earthquake of March 22, the Greek earthquake of April 27, and the Constantinople earthquake of July 10.

SURGEON-CAPTAIN R. H. ELLIOT, of the Indian Medical Service, has recently reinvestigated the value of strychnine as an antidote against snake poison in the most thorough manner. He experimented chiefly with cobra poison, but also with the venom of Russell's viper and the krait, using frogs, lizards, ducks, fowls, hares, guinea-pigs, dogs, goats, pigs, and monkeys as test animals. He confirms the results of Drs. D. D. Cunningham and A. A. Kanthack, that strychnine is not an antidote against snake poison.

THAT the German Cholera Commission has worked most energetically is shown by the voluminous documents now appearing in the *Arbeiten aus dem Kaiserlichen Gesundheitsamte.* A detailed inquiry has been held into all the various outbreaks of cholera which occurred in Germany between the latter part of the years 1892 and 1893, respectively, and the mass of minute incidents thus collected have been brought together, and cover considerably over 600 quarto pages. The Hamburg inquiry not unnaturally occupies the largest volume, and is extensively illustrated with diagrams, &c. The Commismission has succeeded in producing a most important and valuable contribution to the study of epidemiology, and their labours on cholera must long be regarded as the standard work on the subject. We only wish that influenza, which is now far more constantly with us, and claims such an increasing number of victims, might be subjected to the same crucial inquiry; possibly then, as in the case of the later outbreaks of cholera in Germany, we might be in a position to take some steps to effectually check its apparently capricious career.

A NEW contrivance for reading the position of the pointer in sensitive balances is described by W. H. F. Kuhlmann in the *Zeitschrift für Instrumentenkunde.* It has often been attempted to save time by accurate readings with the aid of a telescope or microscope, but none of those methods have been found to answer the purpose of the practical chemist or physicist. Herr Kuhlmann's contrivance is at once simple and effective. The pointer moves *behind* the divided scale, and the face of the latter is turned towards a concave cylindrical mirror attached to the central column of the balance. This mirror can be adjusted to face the observer, who sees in it a magnified image of the pointer rapidly moving across the magnified scale. It is thus made possible to graduate the scale much more finely than heretofore. The pointer must be very fine at the end, but any danger of its being damaged on that account is obviated by the fact of its moving between the scale and the mirror. Another improvement, described by Dr. Classen in the same number, is an arrangement for exchanging objects and weights without opening the balance case. This is accomplished by making a portion of the scale pans detachable. Each scale pan consists of a set of bent rods. One of these, bent into an irregular shape, can be lifted out and conveyed on a circular rail to the other scale pan, the latter undergoing this operation at the same time. A double weighing is no more troublesome than a single weighing, and the advantages of the method, especially when absolute weights are required, are obvious.

THE phenomenon of polyembryony, or the development of two or more embryos in a single seed, has been the subject of several investigations. It has been shown that it may be due to the division of the nucellus, or to the fusion of two ovules, or to the presence of several embryo-sacs in one ovule. Further, Strasburger has found that it is often to be accounted for by the ingrowth of some cells of the nucellus into the embryo-sac, which there develop into adventitious embryos; in other cases he ascertained that two egg-cells are normally present in the embryo-sac, which on fertilisation give rise to two embryos. Finally, Dodel and Overton showed that it was possible for the synergidæ to develop into embryos. More recently, M. Tretjakow, in a short but interesting paper (*Ber. d. Deutsch. Bot. Gesell.*, February 1895) describes yet another cause of polyembryony. In *Allium odorum*, in addition to the normal embryo formed from the egg-cell, not infrequently the antipodal cells also give origin to embryos. Sometimes only one of these develops, but M. Tretjakow has observed all three antipodal cells start into growth and give rise to three embryos. These antipodal embryos commence their development immediately after the fertilisation of the egg-cell, and the cell-divisions, at least in the earlier stages, correspond exactly with those in the embryo formed from that cell. The Russian author, accepting the view that the antipodal cells are homologous to the vegetative cells of the prothallia of ferns, compares these antipodal embryos with those arising by apogamy on fern prothallia.

In the course of a few remarks made by Prof. D. E. Hughes, F.R.S., at the recent banquet given by the staff of the National Telephone Company, some points in connection with the early history of telephony were mentioned. The text of the speech is published in the *Electrical Engineer* for March 22, and the following note from it is interesting. Prof. Hughes said:—The earliest record of a perfect theoretical electric telephone, was contained in Du Moncel's "Exposée des Applications," Paris, 1854; when M. Charles Bourseul, a French telegraphist. conceived a plan of conveying sounds and speech by electricity. Suppose, he explained, "that a man speaks near a movable disc sufficiently flexible to lose none of the vibrations of the voice, that this disc alternately makes and breaks the current from a battery; you may have at a distance another disc which will simultaneously execute the same vibrations." Unfortunately M. Bourseul did not work out his idea to a practical end, but these few words contain the shortest possible explanation of the theory of the present telephones.

It is now exactly thirty years since Prof. Hughes first experimented with a working telephone. In 1865, being at St. Petersburg in order to fulfil his contract with the Russian Government for the establishment of his printing telegraph instrument upon all their important lines, he was invited by his Majesty the Emperor Alexandre II. to give a lecture before his Majesty, the Empress, and Court at Czarskoi Zelo, which he did; but as he wished to present to his Majesty not only his own telegraph instrument, but all the latest novelties, Prof. Philipp Reis, of Friedericksdorf, Frankfort-on-Maine, sent to Russia his new telephone, with which Prof. Hughes was enabled to transmit and receive perfectly all musical sounds, and also a few spoken words, though these were rather uncertain, for at moments a word could be clearly heard, and then from some unexplained cause no words were possible. This wonderful instrument was based upon the true theory of telephony, and it contained all the necessary organs to make it a practicable success. Its unfortunate inventor died in 1874, almost unknown, poor, and neglected; but the German Government have since tried to make reparation by acknowledging his claims as the first inventor, and erecting a monument to his memory in the cemetery at Friedericksdorf.

Since the enunciation by Virchow, in 1858, of his theory of cellular pathology, much attention has been given to the study of this unit. Nearly all the unsolved problems of medical science involve, in one way or another, the consideration of some one of the functions of the cell. At the Philadelphia Academy of Natural Sciences, on February 5, Dr. C. L. Leonard directed attention to a new method of studying one of these functions. The method consists in making a consecutive series of instantaneous photomicrographs of the same microscopic field, taken at definite intervals, so that a comparative study of the series can afterwards be made. The results obtained by this method are the elimination to a greater extent of the personal equation of the observer, the procuring of incontestable proof of phenomena observed, the extension of the observations over any length of time, and the possibility of studying the changes occurring over the entire field at any one moment. The method also enables the student to study the condition of a fresh, living, unstained specimen for any length of time, in fields taken at definite intervals. So far Dr. Leonard has confined the greater part of his study to cell motion as exemplified in the movements of the red and white blood corpuscles. He exhibited to the Academy a number of photomicrographs illustrating the amœboid motion of the white blood corpuscle, and also showing motion in the red blood corpuscle. Some of the photographs seem to show that diapedesis is not a filtration due to pressure, but is due to a truly amœboid motion and power of the red blood corpuscles. Further photographs illustrated the position of the corpuscles within the capillaries, and showed the presence of nuclei in the red corpuscles of the frog while in the living tissues.

At a recent meeting of the Paris Academy, M. Désiré Korda read a paper on a "thermo-chemical carbon cell." The author finds that if barium peroxide is heated to redness in contact with a carbon plate, the oxide becomes reduced to baryta, and a difference of potential of about one volt is produced, the carbon plate being negative. A similar result was obtained with cupric oxide as soon as a layer of potassium carbonate was placed between the oxide and the carbon, the difference of potential in this case amounting to 1·1 volts. The experiments were in each case performed by connecting a plate of gas-retort carbon by means of a platinum wire to one terminal of a Richard voltmeter, and placing on the carbon a few c.c. of the salt. A platinum wire dipping in the salt served to complete the circuit. On heating the carbon to a dull red heat in a Bunsen flame, a violent effervescence takes place, carbon dioxide being evolved, and the voltmeter shows a deflection corresponding to about 1 volt. This deflection remains constant as long as any of the higher oxide is left.

Readers of Mr. Edward Step's books and magazine articles on popular botanical subjects, will be pleased to learn that he has written a pocket-guide to British wild flowers, to be published by Messrs. Frederick Warne and Co. The title of the book will be "Wayside and Woodland Blossoms."

The fourth part of "Dissections Illustrated" (Whittaker and Co.), by Mr. C. Gordon Brodie, containing sixteen magnificent plates drawn and lithographed by Mr. Percy Highley, has just appeared. Students of human anatomy could hardly desire a handbook in which typical dissections are more clearly displayed than they are in Mr. Brodie's work, which has now been completed. The whole work contains seventy-three coloured plates, drawn to two-thirds natural size.

The Zoological Society of France has just published a new edition of the "Rules of Nomenclature of Organised Beings adopted by the International Congresses of Zoology (Paris, 1889; Moscow, 1892)." A copy will be sent gratis to every professor of zoology or comparative anatomy, director of a museum, library or laboratory, or assistant in the same, also to every learned society, upon application to the general secretary, M. le Dr. R. Blanchard, 7 Rue des Grands Augustins, Paris.

The valuable work in zoology, carried on in H.M. Indian Marine surveying steamer *Investigator*, under Commanders A. Carpenter and R. F. Hoskyn, is already known to many biologists, and Part I. of the illustrations referring to it, now obtainable through Mr. Bernard Quaritch, should make it known to more. The Part contains seven splendid photo-etchings representing twenty-six remarkable fishes, and five illustrative of Crustacea. The former were prepared under the direction of Mr. A. Alcock, and the latter under the direction of Mr. J. Wood-Mason.

Prof. S. H. Vines' "Students' Text-book of Botany" (Swan Sonnenschein and Co.), the first half of which was reviewed in these columns in October last (vol. l. p. 613), has just been published in its complete form. In addition to the sections mentioned in our notice, the work now contains descriptions of the Phanerogams, and the part on the physiology of plants. The whole volume makes a comprehensive text-book of botany possessing many excellent features, and of the usefulness of which there can be no question. It is a pity that so very many literal errors should have been overlooked while the work was passing through the press. The page of errata which precedes the contents is not the sort of thing one looks for in a new book.

THE first *Bulletin* of the Bohemian Academy of Sciences, founded in 1890 by the Emperor of Austria, has just been issued. It contains no less than twenty-three separate memoirs many of which are beautifully illustrated with coloured and other plates, amongst which we may specially mention the twelve successfully-executed photographs illustrating some bio-chemical studies by MM. Kruis and Rayman. There are French, German and Italian communications, so that the *Bulletin* may with justice be called "International." Science is very variously represented, and we find contributions in the departments of mathematics, biology, chemistry, geology, physics, physiology, and bacteriology. The committee of publication is to be congratulated, not only on the high standard of the original work here brought together, but also on the successful manner in which they have produced this journal. In addition to the plates, the printing and paper are both excellent.

THE Report of the Council of the Scottish Meteorological Society, on March 27, shows that the work of the Society is extending. A new station has been established in connection with the Society at Kingussie, Inverness-shire, the instruments for which were supplied chiefly by Mr. John Anderson. The station is under the management of Dr. De Wattville, who commenced the observations on January 1. The work at the two Ben Nevis observatories, made both with the eye and continuously recording instruments, has been carried on with the same zeal and success as in previous years. Much work has been done in the offices in Edinburgh and Fort-William in recopying, on daily sheets, the hourly observations of the two observatories, in connection with an examination of a comparison of the two sets of observations in their bearings on the storms and weather of North-Western Europe. This examination has been recently commenced by Dr. Buchan. The subject is divided into these several parts—cyclones; anti-cyclones; small differences of temperature between top and bottom, including inversions of temperature; very large differences of temperature; great dryness of air at the top; marked differences of wind at top and bottom, both as regards direction and force; relations to reported storms at the lighthouses; conditions under which very diverse readings of the two barometers occur. In each of these cases the weather charts of Europe at the time are thoroughly examined from various points of view. Several of the points examined have already been investigated to some extent; but what is now attempted to be done is an inquiry into their relations to each other. The importance of the inquiry consists in the fact that the high-level station dealt with is situated right in the general path of the cyclones of North-Western Europe, whereas the other high-level stations of Europe that have been used in similar investigations are altogether outside that path. Dr. Buchan has a stupendous piece of work under way, and we trust that it may soon be brought to a successful termination.

THE additions to the Zoological Society's Gardens during the past week include a Vervet Monkey (*Cercopithecus lalandii*, ♀) from South Africa, presented by Mr. H. W. Weguelin; a Rhesus Monkey (*Macacus rhesus*, ♀) from India, presented by Mr. W. H. Hayner; a Pardine Genet (*Genetta pardina*) from West Africa, presented by Mr. George Danes; a Palm Squirrel (*Sciurus palmarum*) from India, presented by Mrs. Henry Jones; a Short-tailed Wallaby (*Halmaturus brachyurus*, ♀) from Queensland, presented by Mrs. L. Thompson; a Vulpine Phalanger (*Phalangista vulpina*, ♀) from Australia, presented by Master John Simonds; a Bronze-winged Pigeon (*Phaps chalcoptera*, ♂) from Australia, presented by Lady Buchan Hepburn; a Grey-breasted Parrakeet (*Bolborhynchus monachus*) from Monte Video, presented by Mr. Rowland Ward; an Egyptian Jerboa (*Dipus ægyptius*) from North Africa, an Oak Dormouse (*Myoxus dryas*), South European, presented by Dr. G. L. Johnson; a Cape Viper (*Causus rhombeatus*) from South Africa, presented by Mr. J. E. Matcham; a Hoolock Gibbon (*Hylobates hoolock*, ♂) from Assam, two Gazelles (*Gazella dorcas*, ♂ ♀) from Nubia, an Oak Dormouse (*Myoxus dryas*), South European, deposited; a Brazilian Three-banded Armadillo (*Tolypeutes tricinctus*, ♂) from Brazil, a Variegated Bittern (*Ardetta involucris*), a White-spotted Rail (*Rallus maculatus*), a Sooty Rail (*Rallus rythyrhynchus*), a Rosy-billed Duck (*Metopiana peposaca*), four Burrowing Owls (*Speotyto cunicularia*) from South America, purchased.

OUR ASTRONOMICAL COLUMN.

COMET *e* 1894 (SWIFT).—The general resemblance of the orbit of this comet to that of De Vico's, 1844 I, was noticed very soon after its first appearance (NATURE, vol. li. pp. 132, 160). Mr. Barnard was, fortunately, able to determine the place of the comet on five nights at the end of January, when it was "most excessively faint and difficult, about 10″ to 15″ in diameter," as seen with the 36-inch refractor. These observations have enabled Dr. Chandler to revise the elements of the orbit, and to undertake a discussion of the possible identity with the comet of 1844 (*Astronomical Journal*, No. 338). Dr. Chandler points out that in view of the numerous close family resemblances among the periodic comets, we can distinguish between similarity or identity in the present case only by actual calculation of the principal planetary perturbations. He has accordingly calculated the perturbations, and he finds that "both in direction and approximate amount these changes are uniformly of the character required to reconcile the differences between the observed orbits of the comets 1844 I and *e* 1894." Some of the results are shown in the following table, the elements for the 1844 comet being those of Brünnow:—

	1844 I	*e* 1894	
		Before perturb.	Observed.
	° ′	° ′	° ′
Longitude of perihelion	278 48·6	283 7·5	296 34·1
„ „ node	64 20	60 24	48 40·7
Inclination	2 54·9	2 53·1	2 57·9
Eccentricity	0·61765	0·60282	0·5719
Period	5·466 years	5·615 years	5·863 years.

Dr. Chandler considers this to be "sufficiently demonstrative of the high probability of identity to justify a more refined calculation at a proper future time." As to future observations of the comet, he is not very hopeful. "The present perihelion distance will probably be changed by Jupiter in 1897 to one considerably beyond the orbit of Mars, so that unless a favourable reversion of the change of brilliancy which apparently took place between 1844 and 1894 should occur, it will in all likelihood hereafter be invisible; at least until, at some future approach to the critical point of disturbance near longitude 165°, simultaneously with Jupiter, it shall be thrown into a path in which, near perihelion, it will be again in reach of our telescopes."

A POSSIBLE NEW SATELLITE OF NEPTUNE.—In the course of a series of micrometric measures of the satellites of Uranus and Neptune, Prof. Schaeberle observed a suspicious object near to Neptune on September 24, 1892, when the seeing was exceptionally fine (*Astronomical Journal*, No. 340). The star or satellite was so faint that it was near the limit of vision of the 36-inch refractor of the Lick Observatory. During an hour and forty minutes, the total change of position angle was 2° greater than could be accounted for by the geocentric motion of the planet with reference to a fixed star, and this strengthens the idea that the object observed may have been a second satellite. At the time of observation the distance from the